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EXAMINER	
NGUYEN, HUY TRAM	
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1797	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/575,661	OKUBO ET AL.	
	Examiner	Art Unit	
	HUY-TRAM NGUYEN	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 June 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *8,10,12-14,17,18 and 26-38* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *8,10,12-14,17,18 and 26-38* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *14 April 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *4/27/06,3/6/09,4/17/09*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 8 and 26-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Hideji Yoshimuta (JP-H5 ('93)-279043 A) in view of Langen et al. (US Patent No. 4,224,258).**

Regarding Claim 8, Yoshimuta reference discloses a device comprising

a dripping nozzle or dripping nozzles of a dripping nozzle device that comprises the dripping nozzle or dripping nozzles for dripping the feedstock liquid including uranyl nitrate **(Figure 1, numeral 1 – dripping nozzle)** to an aqueous ammonia solution **(Figure 1, numeral 12 - aqueous ammonia solution)** wherein the feedstock liquid is transferred from a feedstock liquid reservoir through a feedstock liquid transferring passage to the dripping nozzle or nozzles **(Even though Yoshimuta does not specify a feedstock liquid reservoir and a feedstock liquid transferring passage, these structures are inherently present since working Example 1 of Yoshimuta discloses a uranyl nitrate solution being prepared and transferred to the dripping nozzle to produce drops of the uranyl nitrate solution)** and an aqueous ammonia solution reservoir in which an aqueous ammonia solution is stored **(Figure 1, numeral 13 – settling tank).**

However, Yoshimuta reference does not disclose a remaining feedstock liquid collector placed between a dripping nozzle or dripping nozzles of a dripping nozzle device and the aqueous ammonia solution for receiving a remainder of the feedstock liquid remaining in the feedstock liquid transferring passage when the dripping of the feedstock liquid from the dripping nozzle or nozzles to the aqueous ammonia solution is

stopped; and a feedstock liquid remainder transferring passage for transferring the remainder to the feedstock liquid reservoir.

Langen et al. reference discloses a similar apparatus for producing spherical particles from drops of aqueous nitrate solutions of uranium comprising a diaphragm 7 and funnel 8 placing between a dripping nozzle and the aqueous ammonia solution for diverting the liquid emanating from the nozzle through the funnel 8 when the diaphragm is closes **(Figure 1 and Column 3, Line 61- Column 4, Line 4).**

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the diaphragm and funnel as taught by Langen et al. to collect the remaining feedstock liquid and to divert the remained feedstock liquid back to the feedstock liquid reservoir for future use, since Langen et al. states at **Column 3, Line 61-Column 4, Line 4** that such a modification would prevent drops of aqueous nitrate solution to contact aqueous ammonia phase during the termination of the drop generation.

Regarding Claim 26, Yoshimuta and Langen et al. references disclose the device for recovering a feedstock liquid according to claim 8, wherein the dripping nozzle device comprises nozzles, and the device further comprising a vibrator for vibrating the nozzles simultaneously **(Paragraphs [0025], [0014] and [0033]).**

5. Regarding Claim 27, Yoshimuta and Langen et al. references disclose the device for recovering a feedstock liquid according to claim 8, wherein the feedstock liquid transferring passage comprises a feedstock liquid supplier for supplying the feedstock

liquid to the nozzles substantially at a constant flow rate and without pulsation **(Paragraph [0035]).**

6. Claims 10, 12-13 and 28-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Hideji Yoshimuta (JP-H5 ('93)-279043 A) in view of Kato Ryota (JP 2000-146993A).**

Regarding Claim 10, Yoshimuta reference discloses a device comprising

a dripping nozzle device wherein the dripping nozzle device comprises dripping nozzles and the drops are dripped from each of the dripping nozzles **(Figure 1, numeral 1 – dripping nozzle and Paragraph [0033] - several dripping nozzles)**; and flow regulators, each of which controls an amount of the feedstock liquid to be supplied to each dripping nozzle **(Paragraph [0035])** from a feedstock liquid reservoir in which the feedstock liquid is stored **(Even though Yoshimuta does not specify a feedstock liquid reservoir, this structure is inherently present since working Example 1 of Yoshimuta discloses a uranyl nitrate solution being prepared and transferred to the dripping nozzle to produce drops of the uranyl nitrate solution).**

However, Yoshimuta reference does not disclose a light irradiator for irradiating with light drops of a feedstock liquid that includes uranyl nitrate and each of the drops being controlled depending on conditions of the falling of the drops irradiated with the light.

Ryota reference discloses an apparatus for detection of moving object using light from a light source is irradiated **(Abstract and Paragraph [0010])**.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Yoshimuta with the light irradiator as taught by Ryota, since Ryota states at **Abstract** that such a modification would detect the movement speed and volume of the moving object to find a relational expression which refers to the movement distance and the radius of the liquid drop.

Regarding Claim 12, Yoshimuta and Ryota references disclose the device for supplying a feedstock liquid according to claim 10 wherein the light irradiator is a strobe light irradiator for emitting a light that flashes on and off periodically **(Ryota – Paragraphs [0012] & [0013]).**

Regarding Claim 13, Yoshimuta and Ryota references disclose the device for supplying a feedstock liquid according to claim 10, further comprising photosensors for sensing the light emitted by the light irradiator, and a controller for controlling the flow regulators upon an input of a sensing signal outputted by the photosensors so that the nozzles drip at the same dripping rate, the drops dripped from each nozzle have the same volume, and a drop dripped from one of the nozzles has the same volume as a drop dripped from any other one of the nozzles **(Ryota – Paragraph [0013] – photo detector).**

Regarding Claim 28, Yoshimuta and Ryota references disclose the device for supplying a feedstock liquid according to claim 10, the dripping nozzle device further comprising a single vibrator for vibrating the nozzles simultaneously **(Yoshimuta - Paragraph [0025])**.

Regarding Claim 29, Yoshimuta and Ryota references disclose the device for supplying a feedstock liquid according to claim 10, the dripping nozzle device further comprising a feedstock liquid supplier for supplying the feedstock liquid to the nozzles substantially at a constant flow rate and without pulsation **(Yoshimuta – Paragraphs [0014] & [0033]).**

7. Claims 14, 17, 18, and 30-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Langen et al. (4,224,258)**

Regarding Claim 14, Langen et al. reference discloses a device for solidifying the surfaces of drops, comprising an ammonia gas sprayer with ammonia gas- spraying nozzles, each spraying ammonia gas to each of paths along which drops of the feedstock liquid that includes uranyl nitrate fall to an aqueous ammonia solution stored in an aqueous ammonia solution reservoir, the drops being dripped from a dripping nozzle device wherein the dripping nozzle device comprises nozzles and the drops are dripped from the nozzles **(Figure 2 and Abstract).**

However, Langen et al. reference does not disclose the distance between the ends of the dripping nozzles and the ends of the ammonia gas spraying nozzles is from 10 mm to 40 mm, the shortest distance between the paths along which the drops dripped from the ends of the dripping nozzles fall and the ends of the ammonia gas spraying nozzles is from 3 mm to 15 mm, and the flow rate of the ammonia gas sprayed from the ammonia gas spraying nozzles is from 3 L/min to 25 L/min. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Langen et al. with the claimed distance between the ends of the

dripping nozzles and the ends of the ammonia gas spraying nozzles and the claimed flow rate of the ammonia gas, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller,* 105 USPQ 233.

Regarding Claim 17, Langen et al. reference discloses the device for solidifying the surfaces of drops according to claim 14 except for the flow rates of the ammonia gas sprayed from the respective ammonia gas-spraying nozzles are adjustable. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a controller for adjusting the flow rates of the ammonia gas since it was known in the art to use a controller to regulate the flow rate of materials.

Regarding Claim 18, Langen et al. reference discloses the device for solidifying the surfaces of drops according to claim 14 except for the aqueous ammonia solution reservoir further comprising an aqueous ammonia solution discharger for discharging the aqueous ammonia solution stored therein to keep constant the distance between the ends of the dripping nozzles and the surface of the aqueous ammonia solution **(Figure 2, numeral 9).**

Regarding Claim 30, Langen et al. reference discloses the device for solidifying the surfaces of drops according to claim 14, the dripping nozzle device further comprising a single vibrator for vibrating the nozzles simultaneously **(Figure 2, numeral 3).**

Regarding Claim 31, Langen et al. reference discloses the device for solidifying the surfaces of drops according to claim 14, the dripping nozzle device further

comprising a flow regulator capable of controlling a dripping rate of the feedstock liquid and a volume of each of the drops for each nozzle **(Abstract – vibrator is inherently having a flow regulator to control the velocity of the drops of the solution, producing highly uniform spheres).**

Regarding Claim 32, Langen et al. reference discloses the device for solidifying the surfaces of drops according to claim 30, the dripping nozzle device further comprising a feedstock liquid container capable of containing a predetermined volume of the feedstock liquid supplied from a feedstock liquid reservoir in which the feedstock liquid is stored, the container having an inner volume larger than the inner volume of each of the dripping nozzles, wherein the container supplies the contained feedstock liquid to all the dripping nozzles by the force of gravity (Figure 2, numeral 16).

Regarding Claim 33, Langen et al. reference discloses the device for solidifying the surfaces of drops according to claim 32, wherein the feedstock liquid container has a horizontal section, the area of which is larger than the area of the horizontal section of each of the dripping nozzles **(Figure 2, numeral 16).**

Regarding Claim 34, Langen et al. reference discloses the device for solidifying the surfaces of drops according to claim 32, wherein the feedstock liquid container is directly connected to all the dripping nozzles **(Figure 2, numeral 16 and Column 4, Lines 28-30).**

Regarding Claim 35, Langen et al. reference discloses the device for solidifying the surfaces of drops according to claim 32, wherein the respective ends of all the

dripping nozzles are provided with an edge thinned in the direction of the falling of the drops **(Figure 2, tip of the nozzle is thinner).**

8. Claims 36-38 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Langen et al. (4,224,258) in view of Kato Ryota (JP 2000-146993A) and Hideji Yoshimuta (JP-H5 ('93)-279043 A).**

Regarding Claim 36, Langen et al. reference discloses an apparatus for producing ammonium diuranate particles, which comprises:

(1) a dripping nozzle device, comprising dripping nozzles **(Figure 2, numeral 2')** for allowing a feedstock liquid **(Figure 2, numeral 16)** that includes uranyl nitrate to fall in drops to an aqueous ammonium solution **(Figure 2, numeral 5)** stored in an aqueous ammonia solution reservoir **(Figure 2, numeral 12)**;

(2) a device for recovering the feedstock liquid, comprising :

(2-1) a remaining feedstock liquid collector, placed between the dripping nozzles and the aqueous ammonia solution reservoir wherein the feedstock liquid is transferred from a feedstock liquid reservoir through a feedstock liquid transferring passage to the dripping nozzles, said remaining feedstock liquid collector for receiving a remainder of the feedstock liquid remaining in the feedstock liquid transferring passage when the dripping of the feedstock liquid from the dripping nozzles to the aqueous ammonia solution is stopped **(Figure 1 and Column 3, Line 61- Column 4, Line 4)** and

(4) a device for solidifying the surfaces of the drops, comprising an ammonia gas sprayer with ammonia gas-spraying nozzles, each spraying ammonia gas to each of

paths along which the drops fall to the aqueous ammonia solution **(Figure 2 and Abstract).**

However, Langen et al. reference does not disclose that the feedstock liquid remainder transferring passage for transferring the remainder to the feedstock liquid reservoir**.** It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the diaphragm and funnel as taught by Langen et al. to collect the remaining feedstock liquid and to divert the remaining feedstock liquid back to the feedstock liquid reservoir for future use.

Further, Langen et al. reference does not disclose the device for supplying the feedstock liquid comprising a light irradiator for irradiating the drops with light, and flow regulators, each of which controls an amount of the feedstock liquid to be supplied to each dripping nozzle from the feedstock liquid reservoir, depending on conditions of the falling of the drops irradiated with the light.

Ryota reference discloses an apparatus for detection of moving object using light from a light source is irradiated **(Abstract and Paragraph [0010])**.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Langen et al. with the light irradiator as taught by Ryota, since Ryota states at **Abstract** that such a modification would detect the movement speed and volume of the moving object to find a relational expression which refers to the movement distance and the radius of the liquid drop.

Langen et al. reference also does not disclose the distance between the ends of the dripping nozzles and the ends of the ammonia gas spraying nozzles is from 10 mm

to 40 mm, the shortest distance between the paths along which the drops dripped from the ends of the dripping nozzles fall and the ends of the ammonia gas spraying nozzles is from 3 mm to 15 mm, and the flow rate of the ammonia gas sprayed from the ammonia gas spraying nozzles is from 3 L/min to 25 L/min. It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the apparatus of Langen et al. with the claimed distance between the ends of the dripping nozzles and the ends of the ammonia gas spraying nozzles and the claimed flow rate of the ammonia gas, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller,* 105 USPQ 233.

Furthermore, Langen et al. reference does not disclose the device for circulating the aqueous ammonia solution, comprising an aqueous ammonia solution circulating path through which the aqueous ammonia solution is circulated and returned to the aqueous ammonia solution reservoir, from a lower part of the reservoir, whereby ammonium diuranate particles produced by a reaction between uranyl nitrate and ammonia flow upward in the aqueous ammonia solution.

Yoshimuta reference disclose a similar apparatus for producing Ammonium Diuranate particles having the pipe (9) connected to the bottom of the aqueous ammonia solution tank (13) and the other end to the lateral circumferential wall at the upper location of the part submerged in the aqueous ammonia solution for circulating the ammonia solution around the ammonia solution tank **(Figure 1, numerals 19 and 18)**.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to use the circulating path as taught by Yoshimuta, since Yoshimuta states at **Paragraph [0031]** that such a modification would prevent ammonium diuranate particles from accumulating on the bottom and deforming from the own weight.

Regarding Claim 37, Langen et al., Ryota and Yoshimuta references disclose the apparatus for producing ammonium diuranate particles according to claim 36, wherein the device for circulating the aqueous ammonia solution comprises a pipe for circulating the aqueous ammonia solution connected to a side hole formed in a sidewall of the aqueous ammonia solution reservoir and a bottom hole formed in the lower part thereof; and a pump placed in the pipe for circulating the aqueous ammonia solution **(Yoshimuta – Figure 1, numerals 18 and 19).**

Regarding Claim 38, Langen et al., Ryota and Yoshimuta references disclose the apparatus for producing ammonium diuranate particles according to claim 37, except for the side hole is covered with a member for preventing solids in the aqueous ammonia solution reservoir from flowing into the pipe for circulating the aqueous ammonia solution. It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a membrane or filter on the side hole of the circulating pipe since it was known in the art to use a filter or membrane to prevent to solid from flowing into the pipe and block to flow of liquid in the pipe.

Regarding Claim 39, Langen et al., Ryota and Yoshimuta references disclose the apparatus for producing ammonium diuranate particles according to claim 36 including

the aqueous ammonia solution reservoir has a bottom provided with a collecting pipe **(Langen et al. – Figure 2, numeral 9 – outlet (9)**. However, Langen et al., Ryota and Yoshimuta references do not disclose an opening/closing device capable of opening and closing the collecting pipe . It would have been obvious to one having ordinary skill in the art at the time the invention was made to use a valve for closing and opening the collecting pipe since it was known in the art to use a valve to open/close a flow a material.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to HUY-TRAM NGUYEN whose telephone number is (571)270-3167. The examiner can normally be reached on MON- THURS: 6:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Walter Griffin can be reached on 571-272-1447. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

HTN
6/3/09

/Walter D. Griffin/
Supervisory Patent Examiner, Art Unit 1797